RetCam Shuttle

Ophthalmic Imaging System

User Manual and Service Instructions

PN 20-000238 Rev. B
For use with
software version 5.2

Caution: Federal law (USA) restricts this device to sale by or on the order of a physician or licensed medical practitioner.

Clarity medical systems

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1 Introduction

The **RetCam Shuttle Ophthalmic Imaging System** (system) is designed to allow the quick and easy capture of wide field, high resolution, fully digital images and videos of the eye.

Indications for Use

The RetCam Ophthalmic Imaging Systems are indicated for general ophthalmic imaging including retinal, corneal, and external imaging.

Warnings and Cautions

CAUTION: Federal law (USA) restricts this device to sale by or on the order of a physician or licensed medical practitioner.

WARNING: Prior to using the system, read all user safety information.

WARNING: Before using this equipment to acquire images from patient eyes, users must be trained in proper clinical technique by personnel authorized by Clarity.

WARNING: The RetCam system is designed and tested as a system. Omission or substitution of RetCam components may adversely affect system performance and is strongly not recommended.

WARNING: Unauthorized modifications or additions to the RetCam system (including hardware and software, etc.) could adversely affect system function and will void the warranty.

WARNING: Carefully inspect and clean the lens piece before each use. DO NOT USE if the lens piece has nicks, breaks, scratches, or rough surfaces that may damage the eye.

WARNING: To mitigate the potential for excess light exposure, always start at the lowest light intensity level and increase if necessary. Use only the shortest amount of exposure time necessary; no greater than 5 minutes.

WARNING: Use care when contacting the eye; i.e., use the least amount of pressure and/or movement necessary.

WARNING: To avoid the risk of electric shock, the equipment must be connected to a supply mains with protective earth.

WARNING: To mitigate the potential for excess light exposure, the user should avoid looking directly at the illuminated light source.

WARNING: A risk/benefit ratio must be assessed before confirming a patient for RetCam imaging if they are photosensitive, concomitantly exposed to photosensitizing agents, or aphakic.

System Hardware

The RetCam Shuttle system consists of modules mounted in a stable, high quality integrated mobile cart for easy, safe transport from one location to another. The four casters allow for easy maneuverability and positioning. Figure 1 and Figure 2 below illustrate the system hardware.

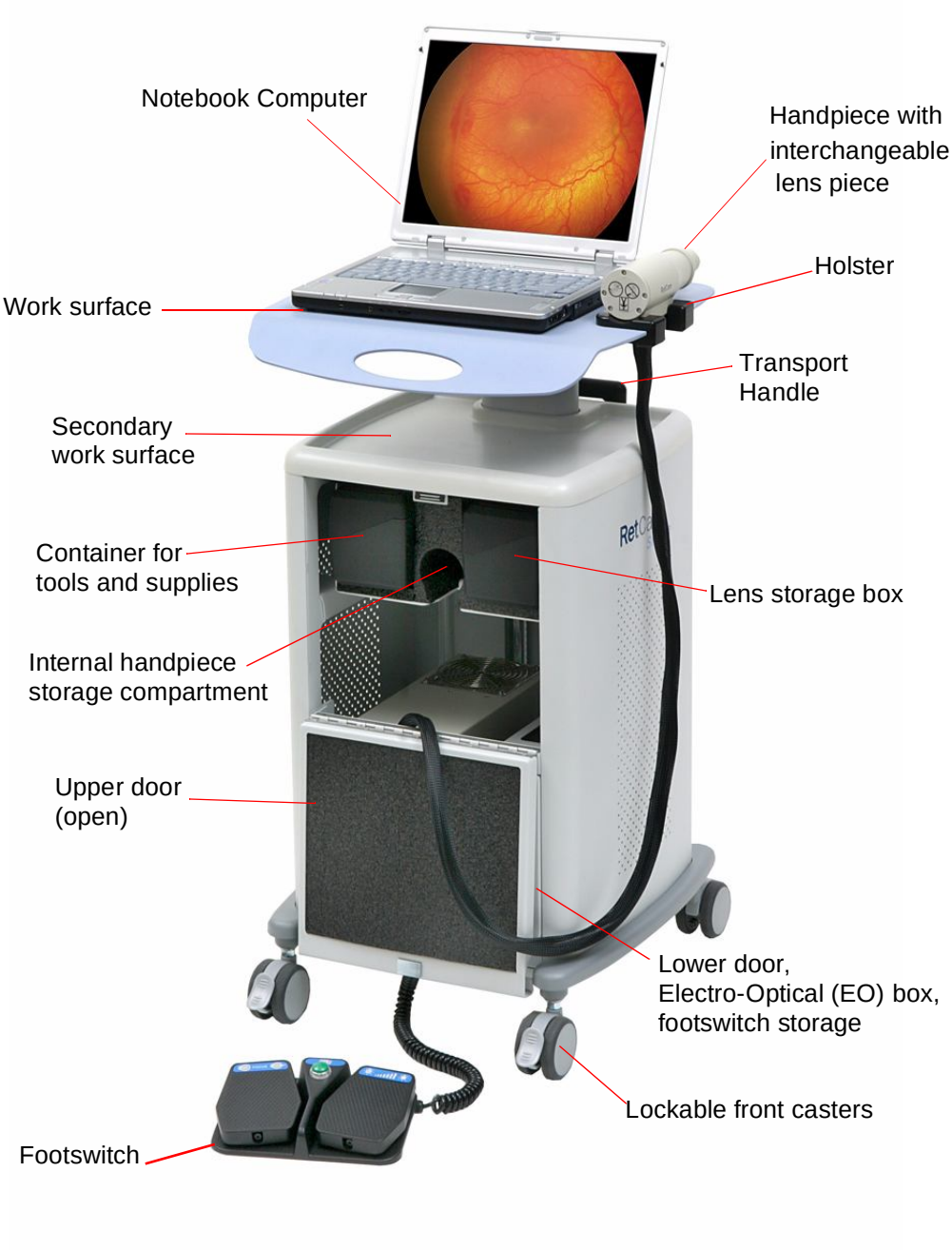


Figure 1 RetCam Shuttle Imaging System (Image representative only)

Hardware Components

- **Notebook Computer:** Pre-loaded with RetCam system software. The notebook computer includes a DVD/R/RW drive, integrated network adapter and USB ports.
- **Handpiece:** Contains the camera. Lightweight and easy to position, it has a long cable for easy reach. Use with changeable lens pieces.

- **Handpiece Interconnect Harness:** Comprises three separate cables: the lamp (fiber optic) cable for subject illumination, the camera controller cable, and the focus motor cable.
- **Handpiece Holster:** Holds the handpiece when the handpiece is not in use.

Note: Always return the handpiece to the holster when not in use. The handpiece cable can be draped over the transport handle, but do not wrap it tightly or damage to the fiber optic may result.

- **Electro-Optical (EO) Box:** Contains the camera control unit, illumination lamp, and the control circuitry.
- **Footswitch:** Provides optical means to control illumination intensity, camera focus, and SNAP.
- **Cart:** Contains the EO box and allows for easy transport from one location to another. Includes an extendable transport handle.
- **Storage Compartment(s):** All units have storage compartments for lens pieces, tools, and supplies.
- **Transport Handle:** Extends to tilt and roll the cart to another location.

Figure 2 Handpiece and Lens Piece

Lens Model	Application	Common Field of View
D1300	Premature Infant	130 Degrees
B1200	Standard Baby	120 Degrees

E800	High Contrast Children's & Adults	80 Degrees
C300	High Magnification	30 Degrees
PL200	Portrait Lens	N/A

Figure 3 Shuttle with all items stowed

Storage

For storage of the system when not in use, disconnect the power cord and store it inside the cart. Stow the handpiece in its compartment behind the upper door and the footswitch in its compartment behind the lower door. Remove all loose objects from the work surfaces. Close the notebook computer and consider removing it to a secure location. Wipe the surfaces with a soft cloth. Apply the brakes to the front casters to keep it in place.

Transport

The system is designed to be transportable, both within and between hospitals, clinics and offices.

Note: The system has no internal power supply (no battery) to support image acquisition while disconnected from a wall outlet. (The notebook computer can operate using its own battery.)

To relocate the system within a building:

1. Power down the system through the software by selecting and then **Shutdown**.
2. Switch OFF mains power on the back of the unit. Unplug the power cord from the wall outlet and drape it over the transport handle.
3. Secure the handpiece in its holster or inside the storage compartment.
4. Unlock the caster brakes.

Now you can gently roll the system on all four casters to the new location. Move the system slowly to minimize vibration. Once in the new location, apply the caster brakes, plug in the power cord and restart the system.

To transport the system to another location:

1. Power down the system through the software by selecting and then **Shutdown**.
2. Switch OFF mains power on the back of the unit. Unplug the power cord from the wall outlet and drape it over the transport handle or store the power cord inside the cart.
3. Carefully remove the lens and store it in the lens box. Secure the handpiece and footswitch in their storage compartments in the cart.

Figure 4 Transporting the Shuttle

4. Remove the notebook computer from the work surface and carry it separately.

5. Close the cart doors. Unlock the caster brakes.

6. Extend the transport handle upward and use it to tilt the cart and roll it to a vehicle for transport.

Inside the vehicle, we recommend that you lay the RetCam Shuttle front side up.

Electrical Safety Information

The system has been designed, inspected and tested to comply with the safety requirements of IEC60601-1 with respect to fire, shock and mechanical hazards only if used as intended.

Class I Type BF Electrical Equipment

Rated for Continuous Operation

IEC 60601-1:1995

Accessories equipment connected to the analog and digital interfaces must be certified to the respective IEC standards (i.e. IEC6950 for data processing equipment and IEC 60601-1-1 for medical equipment.) Furthermore all configurations shall comply with the system standard IEC 60601-1-1. Anyone who connects additional equipment to the signal input part or signal output part configures a medical system, and is therefore, responsible to ensure the system complies with the requirements of the system standard IEC 60601-1-1. If in doubt, contact Clarity service.

WARNING: This equipment should be connected using the power cord supplied by Clarity.

WARNING: To avoid risk of electric shock, this equipment must be connected to a supply mains with protective earth.

Electromagnetic Emissions

Guidance and manufacturer's declaration – electromagnetic emissions		
Emissions Test	**Compliance**	**Electromagnetic Environment – Guidance**
Radiated Emissions CISPR 11/ EN 55011	Class A 30 MHz to 1 GHz	The RetCam system uses RF energy for its internal function. Nearby electronic equipment may be affected.
Harmonic emissions IEC 61000-3-2	Class A	The RetCam system is suitable for use in all establishments other than domestic, and may be used in domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes, provided the following warning is heeded: **Warning:** This equipment/system is intended for use by health care professionals only. This equipment may cause radio interference or may disrupt the operation of nearby equipment. It may be necessary to take mitigation measures, such as re-orienting or relocating the system or shielding the location.
Voltage fluctuations/flicker emissions IEC 61000-3-3	Complies	

Immunity Test Summary

Test Type	Test and Compliance Level	Electromagnetic Environment Guidance
Electrostatic discharge (ESD) EN 61000-4-2	±6 kV contact ±8 kV air	The RetCam Shuttle requires ESD exemption. See Important User Safety Notices.
Electrical Fast Transients/burst EN 61000-4-4	± 2 kV for power supply lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge EN 61000-4-5	± 0.5, 1 kV Line to Line ± 0.5, 1, 2 kV Line to earth	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips and interruptions EN 61000-4-11	>95%, 0.5 Cycles 60%, 5 Cycles 30%, 25 Cycles >95%, 250 Cycles	If the user of the RetCam system requires continued operation during power mains interruptions, it is recommended that the RetCam system be powered from an uninterruptable power supply (UPS).
Power Frequency (50/60) Hz magnetic field EN 61000-4-8	3A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.

Immunity Test Summary

Test Type	Test and Compliance Level	Electromagnetic Environment Guidance
Conducted RF IEC 61000-4-6	0.15-80 MHz, 3Vrms, 80% 1 KHZ AM	Portable and mobile RF communications equipment should be used no closer to any part of the RetCam system, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. **Recommended separation distance** d= (3.5/ E1)x(square root of P) 80 MHz to 800 MHz d= (7 /E1)x(square root of P) 800 MHz to 2.5 GHz where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m). E1 is 3 V/m Conducted Immunity: d= (3.5/ V1)x(square root of P) where V1 is 3 Vrms Field strength from fixed RF transmitters, as determined by an electromagnetic site survey, should be less than the compliance level in each frequency range. Interference may occur in the vicinity of equipment marked with the following symbol.
Radiated Immunity EN 61000-4-3	80MHz-2.5GHz 3V/m 80%@1kHz	
Magnetic Immunity EN 61000-4-8	3A/m 50/60 Hz	Video display terminals and other electron beam devices (e.g. X-ray image intensifiers) may use a justification for lower IMMUNITY COMPLIANCE LEVELS as allowed by 36.202.1 a).

WARNING: Interference may occur in the vicinity of equipment marked with this symbol. This equipment/system may cause radio interference or may disrupt the operation of nearby equipment. It may be necessary to take mitigation measures such as:

- Reorient or relocate the receiving device.
- Increase the separation between the equipment.

- Connect the equipment into an outlet on a circuit different from that to which the other device(s) are connected.
- Consult the manufacturer or field service technician for help.

CAUTION: For continued protection against risk of fire, replace only with same type and rating fuse.

Note: The notebook computer, Hewlett Packard Model 6730B has met all requirements of EN55024 (IT Equipment Immunity Requirements) and IEC 60601-1-1, General Requirements for Safety Collateral Standard: Electromagnetic Compatibility Requirements and Tests. However, this notebook computer does not fully meet Clause 36-202-2 of IEC 60601-1-2. Refer to the Electromagnetic Environment Guidance section in the "Immunity Test Summary" on page 17.

Important User Safety Notices

1. Before moving the system to a new site, carefully remove the lens from the handpiece and store it in the case. Store the handpiece in the cart.
2. Never contact the front of the lens piece with hard or sharp objects. This could damage the precision optics and sealing.
3. DO NOT AUTOCLAVE any part of the device.
4. Appropriately power down and unplug the unit and allow the illumination bulb to cool before replacing it.
5. Newly acquired data may be lost if power is interrupted during live imaging.
6. The system comes protected from viruses, worms, and spyware with Microsoft's anti-malware. Please refer to your warranty prior to adding any additional software or contact Clarity Service.
7. It is possible during the connection of any cable or device into any of the Notebook computer ports the computer may lock up. This is an indication that a source of High Electrostatic Discharge (+/-6 Kv) was discharged into one of the ports of the computer. If this should occur, please reset the Notebook computer's power. To perform a system reset, press the power ON button on the Notebook computer for a few seconds until the system powers down, then press the power button ON again to power the Notebook back ON. This does not present a safety risk to the patient, user, or environment.

Labels and Symbols

Focus Controls

Intensity Controls

SNAP (capture) switch

Read instructions

Caution:
Do not look directly into light source

Protective earth (ground)

Alternating current (AC)

System contains fuse of indicated type.
Do not use any other type.

Non-ionizing radiation

Read accompanying user documentation

Fragile contents

This side of carton up

Temperature limits

Authorized representative in the EU

Type BF equipment (applied part is handpiece)

To prevent damage to lens piece, carefully store handpiece in holster when not in use.

Clean lens piece after use

Separate collection of waste at end-of-life as required by European directives. Contact Clarity for equipment disposal instructions.

European conformity

North American compliance certification

Serial number

Manufacturer

Keep away from the rain

Go to next screen

Hide image

Delete image

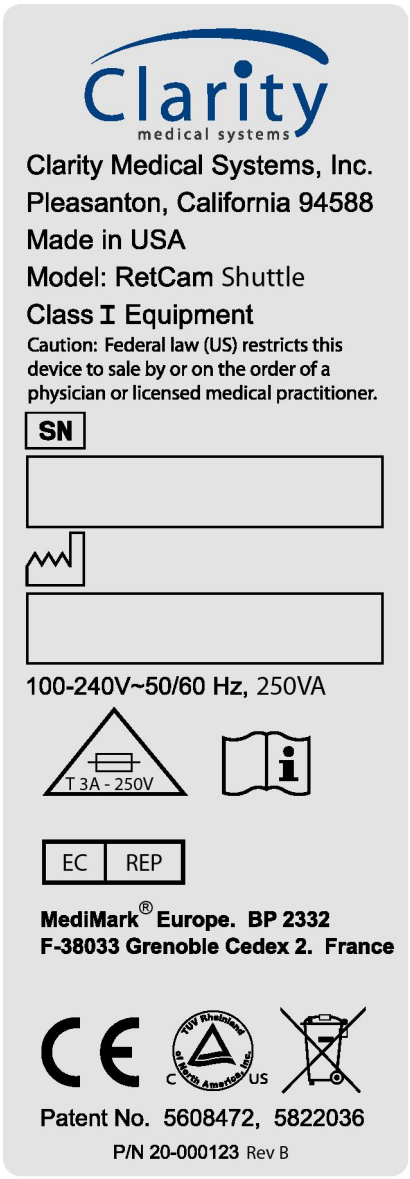
Flag or select item

Reset

View patient directory

Utilities

Label


Clarity
medical systems
Clarity Medical Systems, Inc.
Pleasanton, California 94588
Made in USA
Model: RetCam Shuttle
Class I Equipment
Caution: Federal law (US) restricts this device to sale by or on the order of a physician or licensed medical practitioner.
SN
100-240V~50/60 Hz, 250VA
T 3A - 250V
EC REP
MediMark® Europe. BP 2332
F-38033 Grenoble Cedex 2. France
Patent No. 5608472, 5822036
P/N 20-000123 Rev B

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2 System Functions

This section describes some important system functions.

System Installation

Note: Place components and cabling in a manner to prevent inadvertent hazards to users or equipment.

1. Place the notebook computer on the top of the cart. Open the computer.
2. Install the notebook computer power supply cable from the notebook to the EO box.
3. Install the USB video cable from the notebook to the EO box.
4. Carefully remove the footswitch from the cart.
5. Install the power cord from the back of the cart to the wall power (supply mains with protective earth).

WARNING: This equipment should be connected using the power cord supplied by Clarity.

WARNING: To avoid the risk of electric shock, this equipment must be connected to a supply mains with protective earth.

Turning ON the RetCam System

1. Turn ON the front power switch on the EO box.
2. Turn ON the main power switch on the back of the EO box. The lamp indicator light should be illuminated.
3. Power on the notebook computer. The software should initiate.
4. Carefully remove the handpiece from the case or storage drawer.

Note: Store the handpiece in the case or on the holster when not in use.

5. Attach the desired lens piece to the handpiece as shown in Figure 5 and Figure 6. The display will prompt you when the software is ready.

Note: The system has no internal power supply (no battery) to support image acquisition after disconnected from a wall outlet. (The notebook computer can operate using its own battery.)

WARNING: Carefully inspect the lens and clean the lens piece before each use. DO NOT use if the lens piece has nicks, breaks, scratches, or rough surfaces that may damage the eye.

WARNING: To mitigate the potential for excess light exposure, always start at the lowest light intensity level and increase if necessary. Use only the shortest amount of exposure time necessary; no greater than 5 minutes.

Note: To conserve lamp life, turn OFF the power switch on the front of the EO box.

Lens Installation

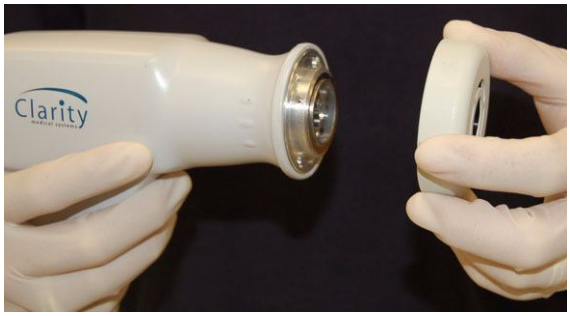

Figure 5 Lens installation

1. Align lens to fit over the pins on the handpiece.

Figure 6 Tighten lens on handpiece

2. Carefully tighten clockwise until the lens clicks into place. Do not overtorque.

Turning OFF the RetCam System

Note: We strongly suggest that you backup and store your data prior to turning OFF the system.

1. Select the red shutdown icon at the bottom right corner of the screen.

2. Select “Shutdown” and confirm.

3. Turn OFF the main power switch on the back of the EO box.

Hard Shutdown

WARNING: Do not use the hard shutdown method unless necessary because data corruption can occur.

1. In the event that hard Shutdown is required, continuously press the System Power button on the notebook computer for at least 6 seconds to force the system, including backup battery, to shutdown.
2. Turn OFF the main power switch on the back of the EO box.

Turning Off for Extended Periods

If you are not going to use the system for an extended period (such as one day or more), it is advisable to switch OFF the EO box only. This will help preserve the illumination lamp.

Note: These actions will remove power from the entire system except the notebook computer.

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3 Using the RetCam System

Managing Patient Records

This section describes how to add a new patient and locate the records for an existing patient.

The software is ready to use when you see the **Start Screen** shown in Figure 7.

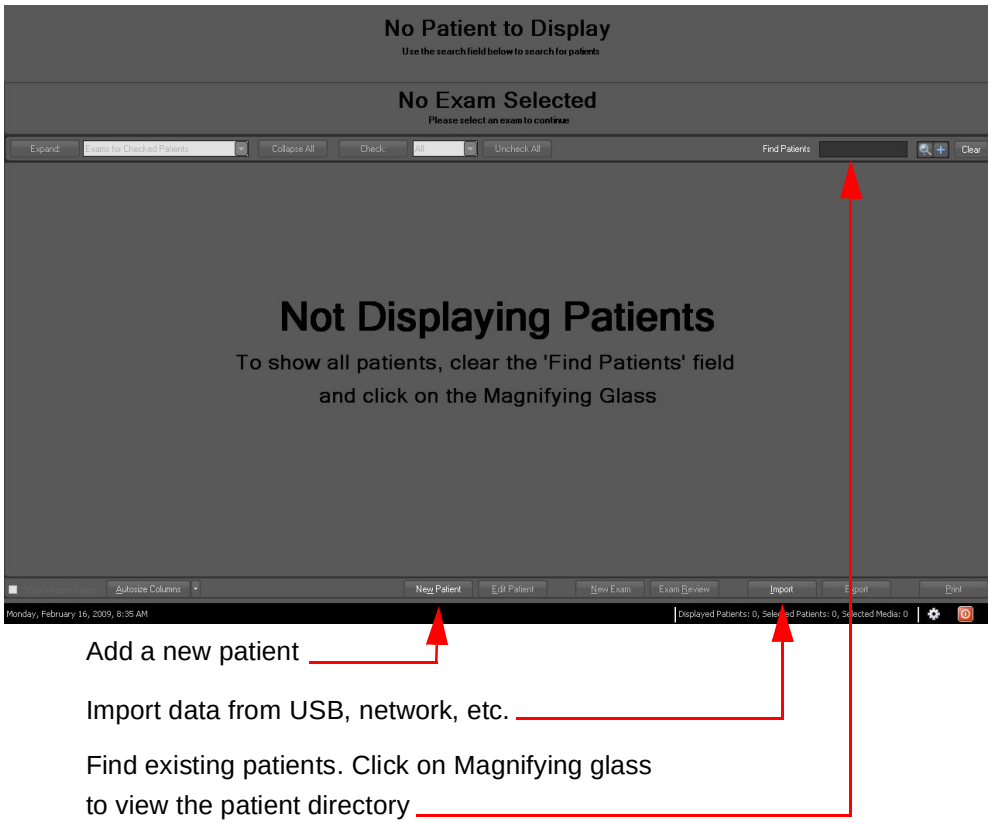


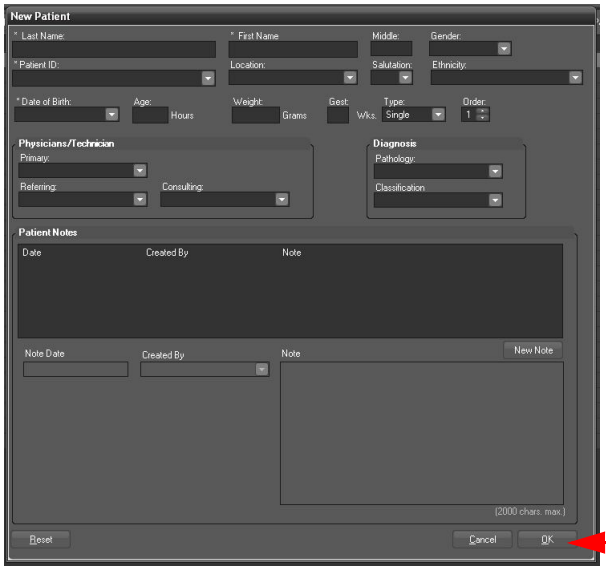
Figure 7 Start screen

Add a New Patient Record

To create a new patient record, the following information is required:

- First Name
- Last Name
- Date of Birth
- Patient ID

Patient information is repeated in several of the screens. The patient name and Patient ID are always shown in the upper left corner of every screen.



Select OK to proceed.

Enter information manually or use menus, where available.

Figure 8 Add new patient screen

Editing a Patient Record

Highlight the patient's record from the Patients and Exams screen.

Select Edit.

You can edit the following information:

- First Name
- Last Name
- Gender (Male, Female, Other, or Unknown)
- Date of Birth
- Weight (in grams)

Note: Any fields on the Edit Patient Screen are editable.

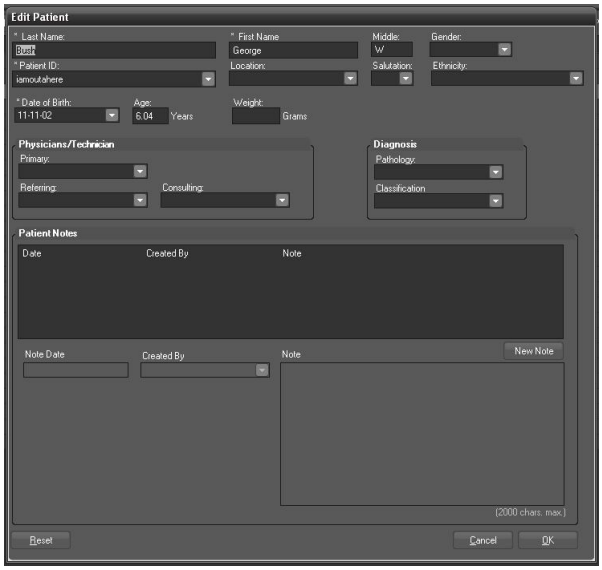


Figure 9 Edit patient record screen

Finding Existing Patient Records

You can search the directory to locate specific patient records.

Figure 10 Search buttons

From the Start screen, select the icon to display the entire patient directory or select the plus sign to locate patient records using one or more of the search features (see Figure 11).

Figure 11 Patient search options

Select **Clear** to clear all search fields.

Search Results

When you select the to display the entire patient directory, the results are displayed as shown in Figure 12.

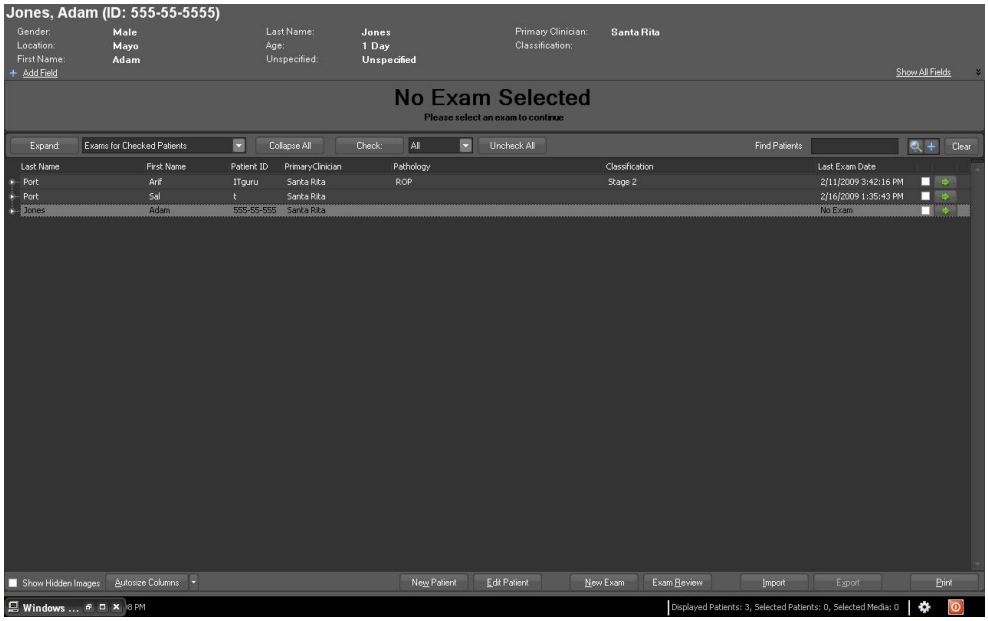


Figure 12 Patients and Exams Screen (Patient Directory)

From the **Patients and Exams Screen**, you can use the buttons shown in Figure 13 to sort the results.

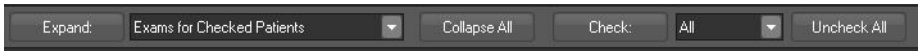


Figure 13 Patients and Exams screen navigation buttons

Performing Exams

You can use the RetCam system to capture still images or video after selecting a patient. Select the green arrow on the right side of a patient name, or select the New Exam button. To start an exam, you can select a Preset Configuration, which can be easily edited, or Manual Configuration.

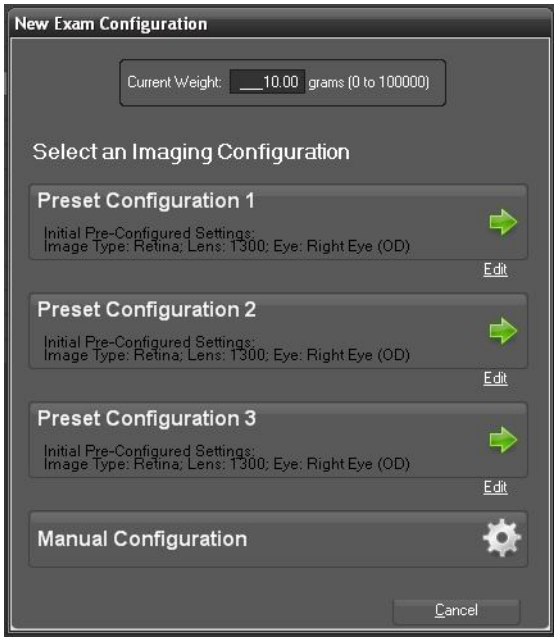


Figure 14 New Exam configuration screen

The following Information can be defined in the Preset or Manual Configuration:

Image Type	Lens	Eye
Retina	300	Right (OD)
	800	Left (OS)
Anterior Segment	1200	Unspecified
Unspecified	1300	
	Unspecified	

Once the new exam is configured, select the green arrow to the right to enter the New Exam screen.

Capturing Still Images

In the New Exam screen, you can add the name of the Imaging Technician in the upper right corner of the screen.

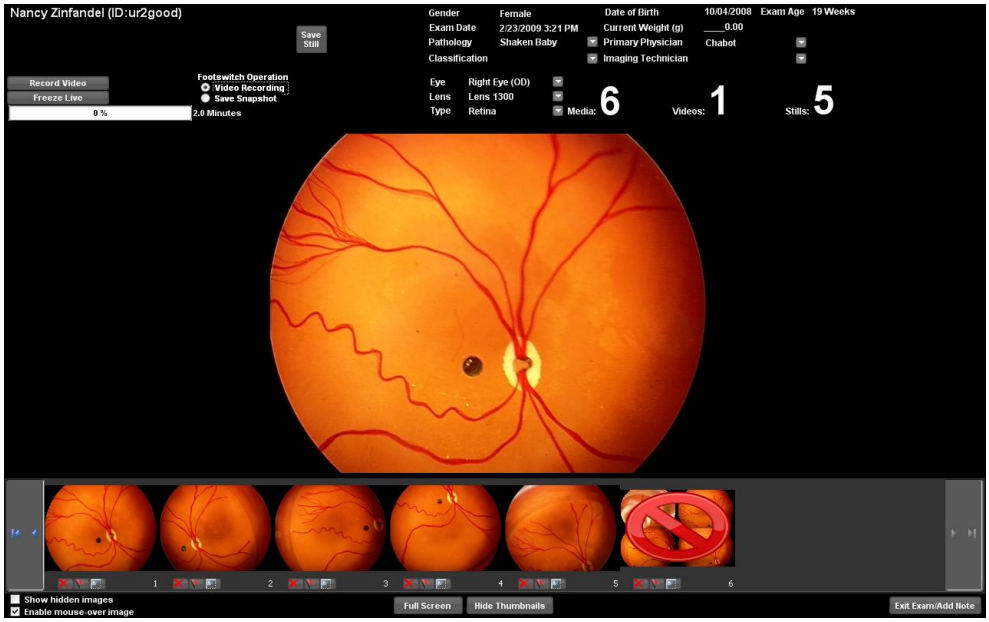


Figure 15 Still image screen

1. Set the Footswitch Operation to Save Snapshot (default).

2. Adjust the focus and light intensity using the footswitch.
3. Depress the green SNAP button to capture a still image. You can also capture an image using the "S" key on the Notebook keyboard or by selecting the Save Still button.
4. The saved image appears in your thumbnail display (if the "show thumbnails" option is enabled).

Capturing Video

1. Set the Footswitch Operation to Video Recording.

2. Adjust the Focus and Light Intensity using the footswitch.
3. Depress the green SNAP button to Start and Pause video recording. The progress bar will display the amount of video recorded. You can also depress the spacebar on the Notebook computer to Start and Pause Recording.

Note: You can capture still images by depressing the Save Still button during video recording.

4. Select the Stop Recording button to STOP recording video.

5. A 2 by 2 block of pictures appears in your thumbnail (if the "show thumbnails" option is enabled). The video is automatically marked for deletion.
6. To save the video, deselect the red X below the video thumbnail.

Figure 16 Deselect the red X to save video

Note: The storage capacity of the system hard drive is a maximum of approximately 100,000 still images or a maximum of 140 minutes of total video (for example, 70 videos of 2 minutes duration each or 280 videos of 30 seconds each). Saving a combination of videos and stills will affect the total number of each that can be saved. Saving images with annotations reduces the total number of images that can be saved.

Recommended Procedure

Because saving video consumes a great deal of disc space, to maintain optimal system performance we recommend that you capture video of the entire exam, save stills from the video, and delete the video. To do this:

1. Capture video (see Capturing Video) but DO NOT SAVE the video. Instead double click the video in the thumbnail display (the hover over image feature must be disabled) to go to the Review Screen.
2. In the Review Screen, use the video playback features to replay the video and

.

3. Select this button to return to the New Exam screen.

Figure 17 Video playback controls

4. In the New Exam Screen, the viewed video is marked for deletion (unless you saved the video as shown in Figure 16). View the exam thumbnails and select any other images for deletion.

Video Playback

Video playback buttons are:

Reverse, pause, and play

Fast forward

Go to the beginning of the recorded video

Go back one video

Advance one video

Go to the end of the recorded video

Control the rate of playback or search.

Use the buttons or the scrollbar to locate images of interest.

Figure 18 Video controls and scrollbar

0 **Tip:** Using the left and right arrow keys on the keyboard will also move the video back or forward one frame at a time.

Using Helpful Features

The RetCam software includes some useful features to streamline your work.

Shortcut Keys

An underlined letter indicates a quick key. To use a quick key, press ALT and the letter key simultaneously.

+ **Note: Do not use Windows shortcut keys, for example Copy (Ctrl+C), Paste (Ctrl+V), Undo (Ctrl+Z), and others.**

Changing Image Capture Options During an Exam

Before you start imaging, verify that the options displayed for eye, image type and lens piece are correct. If necessary, you can edit options from the image capture screen.

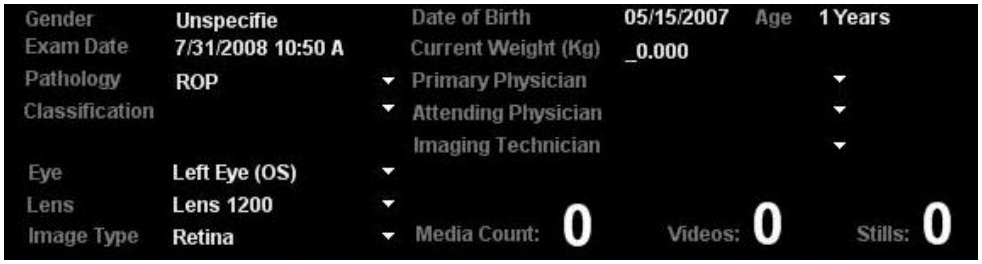


Figure 19 Select options for image capture

Eye Changing: Right Eye (OD) / Left Eye (OS)

To image the other eye in the same session, expand the **Eye** menu and select the other eye (**Right Eye (OD)** or **Left Eye (OS)**). The **Eye** selection is saved with the image.

Note: When using this option, be careful that you select the correct eye before you save the image. This is especially important when both eyes are captured in one video clip, and you save still images from the video. Make sure you select the correct eye before you save each still image from the video.

Note: Images and video can be selected for deletion only during the imaging session. Once the session has been exited, the images will be saved for that session.

Lens Changing Lens

You can also select a different lens piece during imaging. Expand the **Lens** menu to select **1300** (Premature Infant), **1200** (Standard Baby), **800** (Posterior), **300** (High Mag), or **Unspecified**. The lens piece selection is saved with the image.

Image Type Changing Image Type

Expand the **Image Type** menu to select **Retina, Anterior Segment,** or **Unspecified** during an imaging session. All selections record the images in color. The Image type selection is saved with the image.

Enable mouse-over image preview: When hovering over thumbnail images, a larger image will appear. By default, this feature is selected on and may be turned off.

Figure 20 Enable mouse-over

Adding Exam Notes

When you select the **Exit Exam/Add Note** button at the bottom right corner of the image capture screen, the Exam Notes dialog appears. For each eye, it provides a field where you can type in notes.

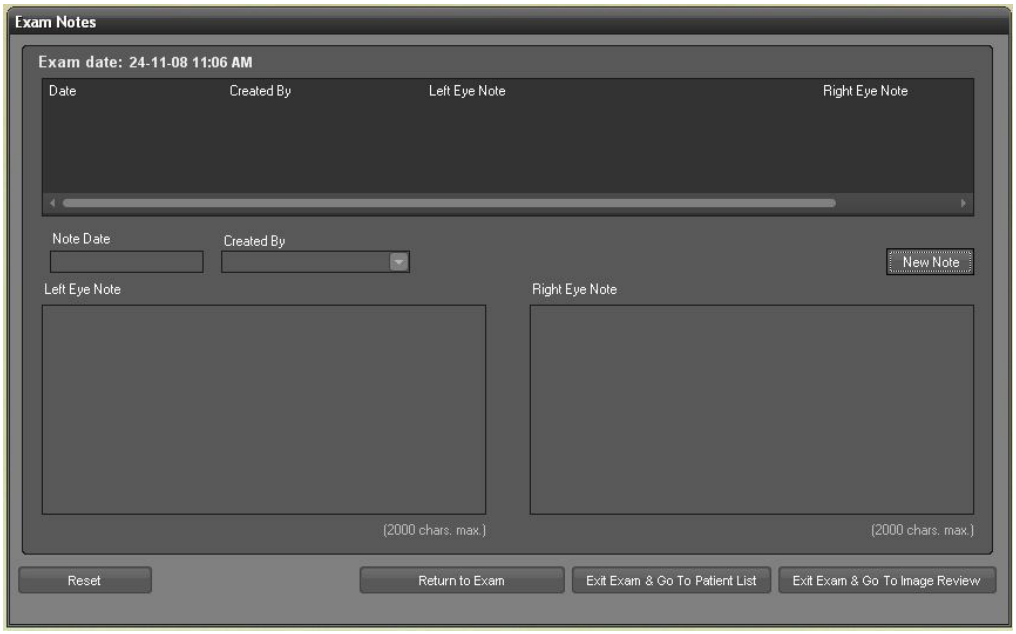


Figure 21 Exam Notes dialog

To add notes:

1. Select **New Note** to activate the notes fields.
2. Input **Created By** information.
3. Type new notes in the fields titled **Left Eye Note** and **Right Eye Note**.
4. Select **Save Note** to add notes you have typed to the notes above.

Note: You cannot change a note after you select Save Note.

- Select **Reset** to clear all fields.
- Select **Return to Exam** to save note and return to Live Imaging.
- Select **Exit Exam & Go to Patient List** to save note and return to the Patients and Exams screen.
- Select **Exit Exam & Go to Image Review** to save note and return to the image review screen.

You can add notes also from the Review screen. Once saved, the text cannot be modified. You can append text to notes from the Review, Compare, and Image Process screens by selecting **Exam Notes**. Notes are identified by date/time and person creating the note.

4 Image Review and Compare Mode

Having acquired images, they are available for review and comparison This section covers the following topics:

- Image Review Screen, below
- Compare Mode, page 37
- Image Adjustment, page 39

Image Review Screen

The Image Review screen appears optionally when you exit live imaging. You can also access it by selecting the Exam Review button on the Patients and Exams screen.

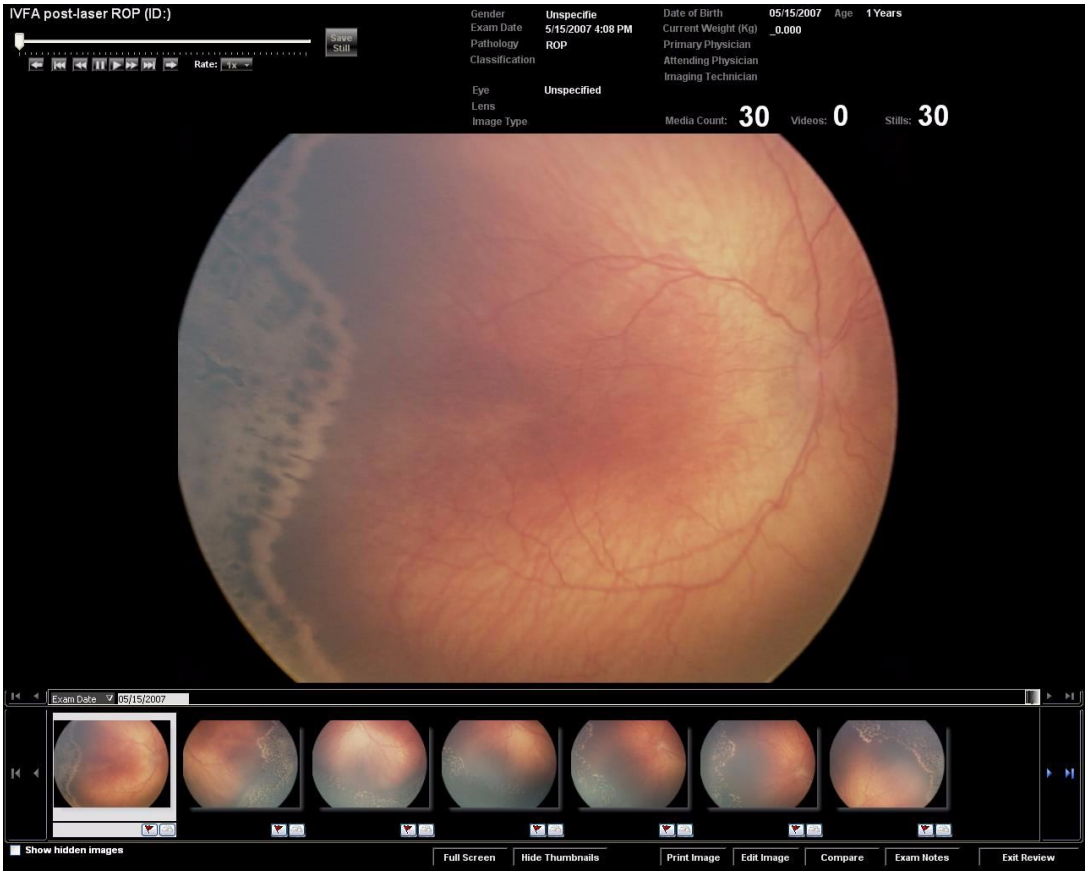


Figure 22 Image Review screen

The Image Review screen displays the images acquired in the session just completed. When you access the Image Review Screen by other means, it displays the images for the last patient and session you selected. To review exams for a different patient, exit to the Patients and Exams screen, and select another patient.

By default, thumbnails for all images acquired in the selected session appear along the bottom of the screen.

Video playback controls appear in the upper left corner of the screen.

The currently selected image (the first one by default) appears full size. Select a thumbnail to display the full resolution image. You can use the arrows at the left and right edges of the thumbnail strip or the up and down arrow keys on the keyboard to scroll through the thumbnails or select a thumbnail.

Thumbnails of video clips show four images (first, last, and two intermediate images in the video) in the quadrants of a square.

Click on the thumbnail to bring the video to the display area. Use the video playback buttons to control the video. The buttons have the same functions as for live imaging. Click **Play** to start playing video.

The following options are available on the Review Screen:

Exam Date

Select a different exam to review by clicking the arrow next to **Exam Date**.

Show Hidden Images

Default is unchecked, in which case only thumbnails of non-hidden images are displayed. When this box is checked, thumbnails for hidden images appear and are available for full size viewing.

Hide Image

Click the **Hide Image** icon below the highlighted thumbnail to hide the current image. You can click this icon beneath any thumbnail to hide that image. You can use the icon to toggle between hidden and unhidden . Hidden items are not deleted. Their thumbnails do not appear unless the **Show hidden images** box is checked.

Unhide Item

When **Show hidden images** is checked, select the **Hide Image** icon to unhide an image. The hidden image icon appears in the upper right corner of the thumbnail for a hidden image.

Flag Image

Click the **Flag Image** icon to flag the current image as an image of special interest. A small red flag appears at the top left corner of the thumbnail. To unflag an image, click the icon again. The icon toggles between flagged and unflagged.

Full Screen

Click **Full Screen** to display a full screen view of the current image, with no thumbnails visible.

Hide Thumbnails

Click **Hide Thumbnails** to remove the thumbnail display without changing the display of the current image.

Print Image

Click **Print Image** to print the current image displayed.

Edit Image

Click **Edit Image** to edit the current image.

Compare

Click **Compare** to view two images side-by-side on the screen. See Compare Mode for details.

Exam Notes

Click **Exam Notes** to review or append text to the session notes in the Review screen. You cannot alter saved notes. Notes are identified by date and created by.

Exit Review

Click **Exit Review** to exit the current review session and return to the Patients and Exams screen.

Compare Mode

The Compare screen appears when you click **Compare**. Use the Compare screen to compare any two images. You can compare images for one or more exams for a single patient.

.

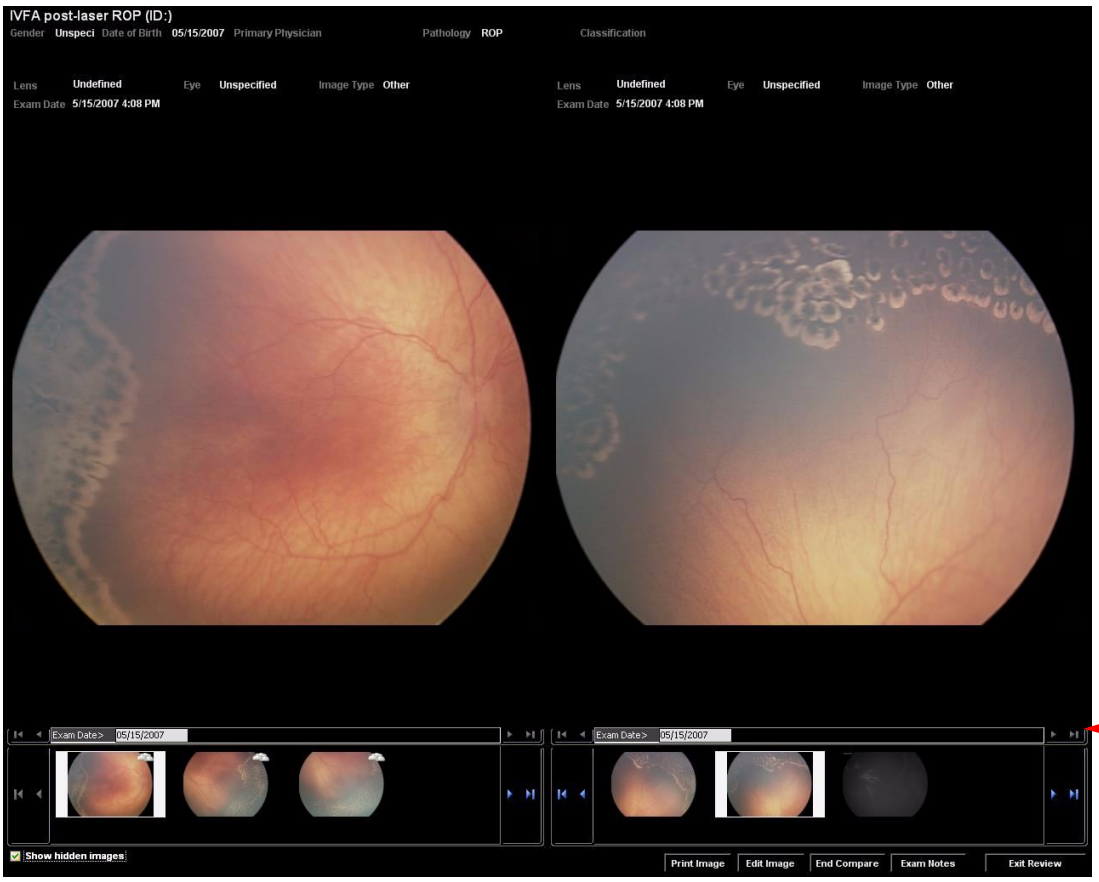

IVFA post-laser ROP (ID:)
Gender Unspeci Date of Birth 05/15/2007 Primary Physician Pathology ROP Classification
Lens Undefined Eye Unspecified Image Type Other
Exam Date 5/15/2007 4:08 PM
Lens Undefined Eye Unspecified Image Type Other
Exam Date 5/15/2007 4:08 PM
Exam Date> 05/15/2007
Exam Date> 05/15/2007
Show hidden images
Print Image
Edit Image
End Compare
Exam Notes
Exit Review
Exam Selector

Figure 23 Compare [Images] screen

The last image displayed on the Image Review screen will appear on the left side of the Compare screen. On the right side, by default, the first image of the first session for the same patient appears. Identifying information for each image appears above it. Below each image at the bottom, thumbnails appear for all images in the same session. The Exam Selector displays the dates for all the current patient's exams above the thumbnails. The highlighted date is the exam date for the current thumbnails. To view images from a different exam, select another exam date from the Exam Selector.

The video playback controls are not displayed on this screen because It is not possible to compare videos.

The Compare screen provides a toolbar for the following options:

Show hidden images

The check box for displaying hidden images is available.

Print Image

Click **Print Image** to print the two images displayed on this screen, one above the other.

Edit Image

Click Edit Image to display the Image Adjustment window.

End Compare

Click **End Compare** to return to the display of a single image.

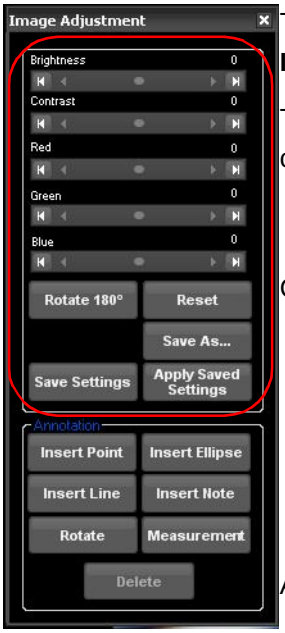
Exam Notes

Click **Exam Notes** to review or append text to the exam notes for that image. You cannot alter saved notes. Notes are identified by date/time and person creating the note.

Exit Review

Click **Exit Review** to return to the Patients and Exams screen.

Image Adjustment



To adjust an image, select the image from the Image Review screen and click **Edit Image**.

The Image Adjustment window appears. To exit the Image Adjustment window, click the “X” in the upper right corner of the window.

Image Adjustment Parameters

Controls to adjust the image display parameters are:

- **Brightness**
- **Contrast**
- **Red**
- **Green**
- **Blue**

All parameters have a default setting of zero (0), and range from -100 to +100.

- Each click on the right or left arrow at the end of the slider bar changes the parameter value by 1.
- Each click on the bar to the right or left of the slider changes the parameter to the end of the range.

Rotate 180º

Click this button to rotate the image 180º.

Reset Button

Click **Reset** to reset all display parameters to zero.

Save As

Select to export the image.

Save Settings

Click to save the current settings for **Brightness, Contrast** and **Red, Green** and **Blue**. The saved settings can be applied when you select **Apply Saved Settings**.

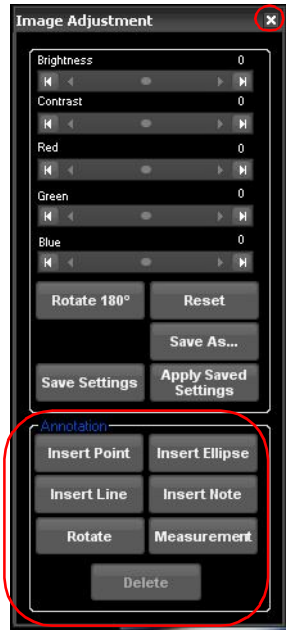
Apply Saved Settings

Click to apply the currently saved settings for **Brightness, Contrast** and **Red, Green and Blue**. Image display adjustments are applied to all images in the current image processing session, until you save new settings or click the **Reset** button, which resets all parameters to zero.

When you leave the current session, the display settings are reset to zero.

Note: Images you save from the Image Adjustment window will reflect image display adjustments (and all other changes) you make, but the original images in the database will not be changed.

Annotation



You can annotate an image by inserting graphic elements or text notes.

Click to select any of the following annotation features:

- Insert Point—Insert pointer and text on the image.
- Insert Ellipse—Draw an ellipse on the image.
- Insert Line—Draw a line on the image.
- Insert Note—Add text to the image.
- Rotate—Rotate the pointer.
- Measurement—Display the number of pixels between two points.
- Delete—Remove a selected annotation.

Select the “X” at the top right to close the screen.

Note: The original images in the database are never changed, even when you modify the image displayed on the screen. You can save processed images only outside the RetCam database and in a non-proprietary format.

5 Import and Export Images

You can import or export images:

- To make RetCam data available on other RetCam stations, which include RetCam 3 and RetCam II systems, and PCs running RetCam Review Software.
- To make a backup copy of the original image data kept on the hard drive.
- To view with standard image software.
- To use RetCam images with third party imaging systems.

Backing Up Images

The RetCam system stores all images to the local hard drive. It is highly recommended to create a central repository on a network of all data from the RetCam device for long term data backup.

Recommended Backup Frequency: Each day you acquire new images.

Backup Recommendation: Network or Removable USB Mass Storage Device

For long-term backup, we recommend backing up to another computer on your office network, preferably a server-class computer with large capacity and redundant storage functionality (Redundant Array of Independent Disks, or RAID). Since USB devices can be directly addressed like a network location, and USB devices can have very large capacity, we also recommend the use of a removable USB mass storage device. For secondary backup in this scenario, you may consider using a second removable USB mass storage device.

Compatible Removable Media

For transfer or backup of smaller amounts of data, you can use a USB memory stick. Like any Windows XP computer, the Notebook computer supports nearly all USB devices. While the RetCam system can read from all standard kinds of CDs, DVDs and USB devices, it can write only to USB devices during data transfer. It cannot write to CD-R, CD-RW, DVD±R nor DVD±RW.

Note: From the system software, you can write (transfer) data to network folders or USB devices; you cannot write to CD-R, CD-RW, DVD±R nor DVD±RW.

Note: Clarity Medical Systems has successfully tested many "SanDisk" brand USB memory sticks. Some USB sticks require special formatting before use with RetCam systems and we recommend purchasing pre-formatted USB sticks directly from Clarity. Call (800) 215-6005 toll-free in the US and ask for part number 03-12-025. If you are experiencing problems with your USB stick contact Clarity Customer Support. (See complete Clarity Service Contact Information on page 66.)

Exporting Images

You can export data to any accessible location. There are three general steps to complete export. These are:

1. Select Images for Export, below
2. Select Export Options, page 43
3. File name format menu, page 45

Select Images for Export

1. Go to the **Patients and Exams Screen** and check the box next to each image for export. You can also use the automatic Expand and Check box features located in the upper menu.

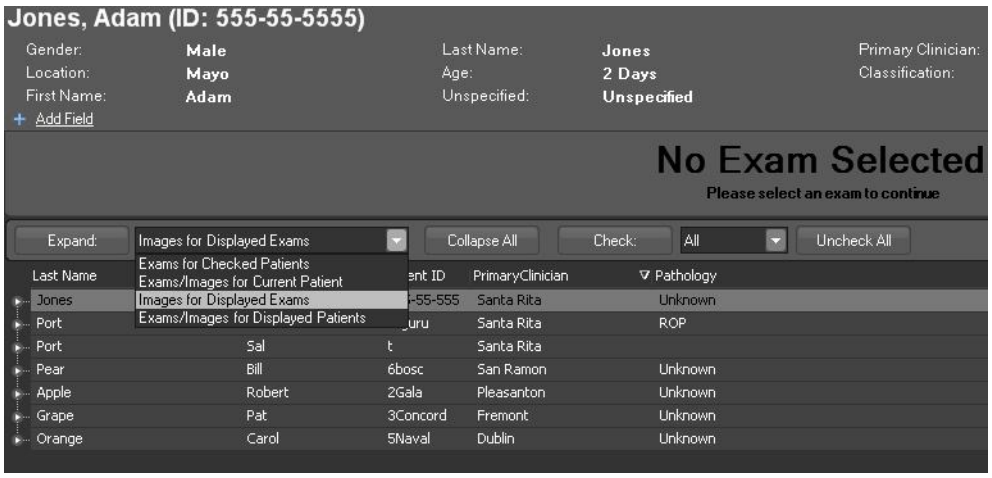


Figure 24 Select patients and exams for export

2. Select the Export button on the lower menu.

3. The Export dialog appears.

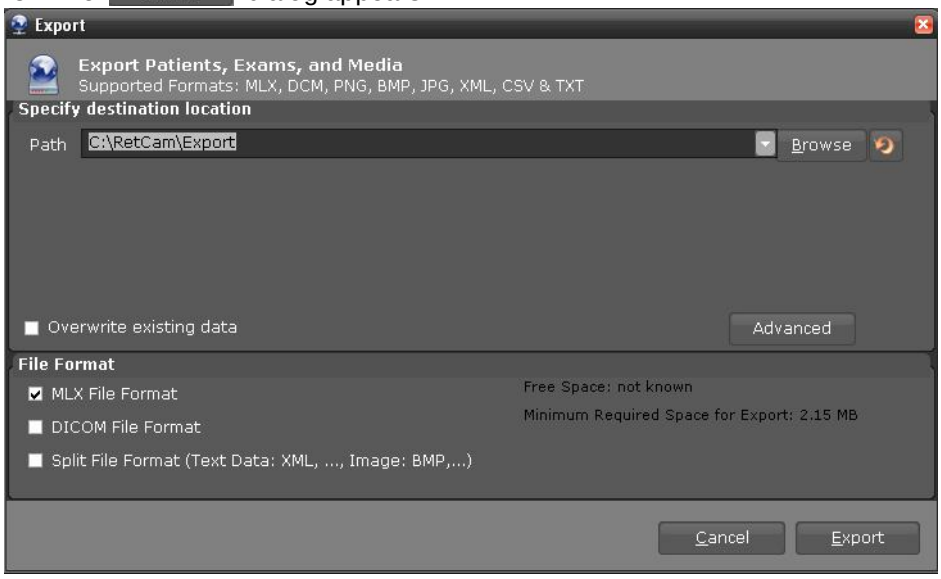


Figure 25 Export dialog

By default, the dialog shows the last destination location path used.

Note: The Minimum Required Space for Export is displayed. Verify that the export destination has sufficient free space to accept the exported files.

Note Regarding File Size Capacity: We recommend that you do not export more than 2000 images in one batch, because the export will take a long time. We recommend that multiple smaller transfers be executed.

Select Export Options

1. To change the destination location path, select Browse. Selecting the red reverse arrow resets the source location to the default setting.

Figure 26 Export dialog showing closeup of destination

2. Select **Overwrite existing data**. This optional feature is useful if you are refreshing backup data:
3. Select File Format.

File Format
MLX File Format
DICOM File Format
Split File Format (Text Data: XML, ..., Image: BMP,...)
Free Space: not known
Minimum Required Space for Export: 2.15 MB
Minimum required space indicated

Figure 27 File format

Format Options

MLX	Clarity's proprietary encrypted data format
DICOM (DCM)	DCM is the filename extension for patient data files that are compatible with the DICOM (Digital Imaging and Communications in Medicine) standards for ophthalmology.
Split File Format	If you select this format, you will have additional options for the Export Image and Export Data features shown below.

Export Image Formats

PNG	Portable Network Graphic uses compression to reduce file size (about half the size of a bitmap file), but without loss in quality or resolution. It can be viewed in a standard web browser and used in image processing or viewing applications.
BMP	The bitmap format saves images at full resolution without any quality loss. It results in the largest files.
JPG	(or JPEG) This format uses compression to reduce file size, which results in loss of resolution or quality in proportion to the amount of compression. You can select the image quality before you save.

Export Data Formats

XML	Extensible markup language format
CSV	Comma separated values format
TXT	Generic text format

4. Select Advanced to display advanced features.

Note: Verify that the export destination has the required space available before continuing.

Select Advanced Options

The advanced features option allows you to:

- Create subfolders

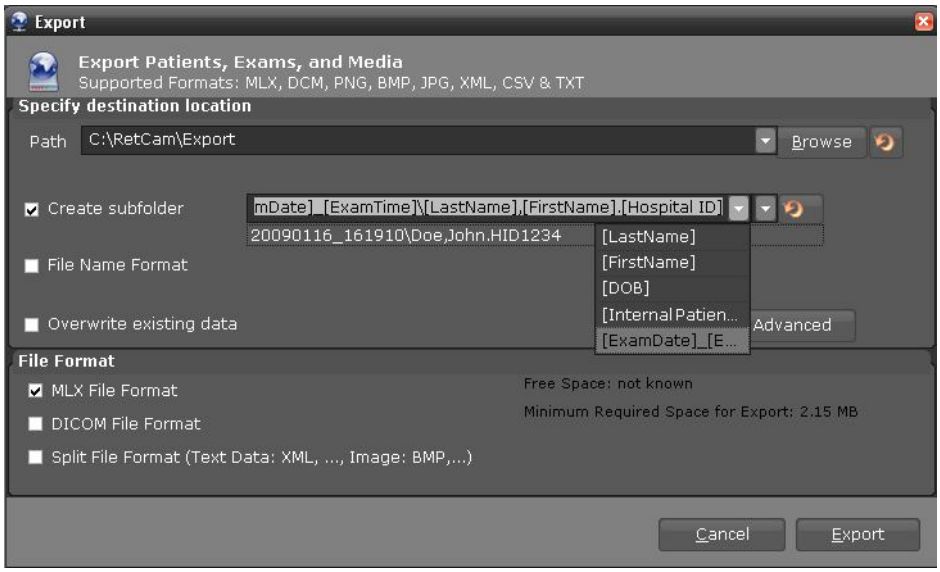


Figure 28 Create subfolders menu

- Choose a File Name Format

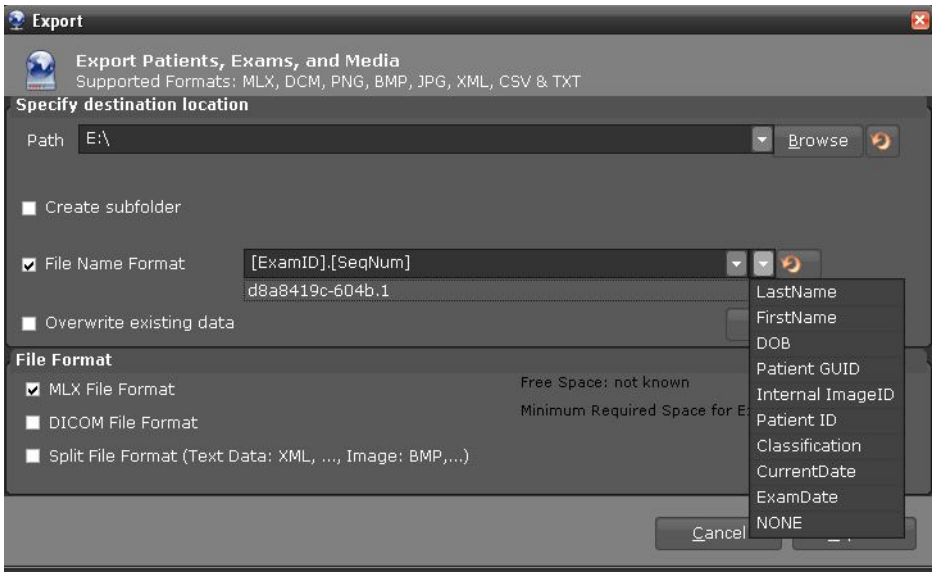


Figure 29 File name format menu

Complete Export

Select Export to initiate exporting or Cancel. A dialog opens to show export progress.

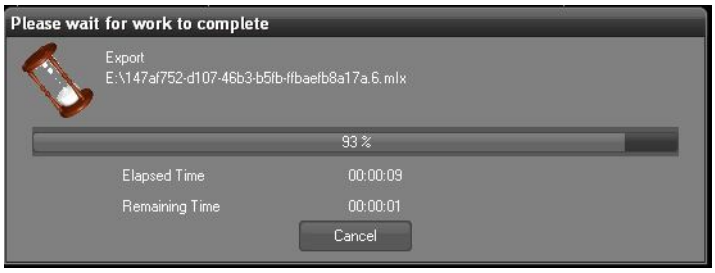


Figure 30 Export progress dialog

Importing Images

Except for data backup, the export destination on the network is an intermediate location. To complete the data transfer and make the images available for viewing on another RetCam system, you must use the RetCam software to import the transferred images into the target system database.

WARNING: Never connect the RetCam Shuttle to a network or any externally powered devices or peripherals *during imaging*.

Note: We recommend that you do not import more than 2000 images in one batch, because the import will take a long time. One way to limit batch size is to import only the files from which you (or someone else) exported a limited number of images. In general, we recommend you import images from one patient at a time.

Follow these steps to import RetCam images:

1. On the screen shown in Figure 31, select Import .

Figure 31 Start screen

The Import Folder dialog appears

.

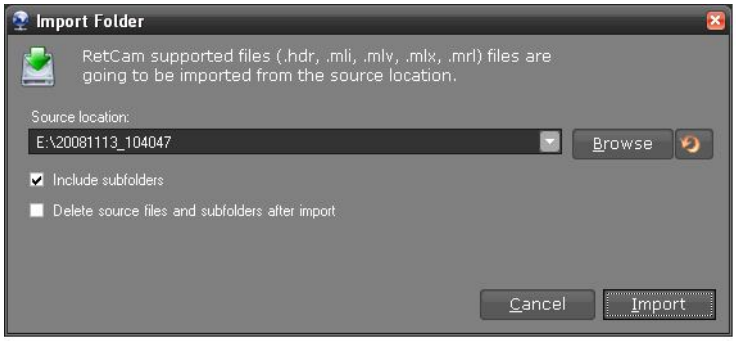


Figure 32 Import Folder dialog

By default, it shows the **Source location** path and all the options last used.

2. To change the source location, select the arrow to expand the path list or select **Browse**. Selecting the red reverse arrow resets the source location to the default setting.
3. Once the desired Source location is showing, you can select import options.
4. Select Import to initiate importing.
5. A **Select Import Data to save** dialog will appear.

6. View imported data. Check **Selector** on the images or patient data you would like to import.

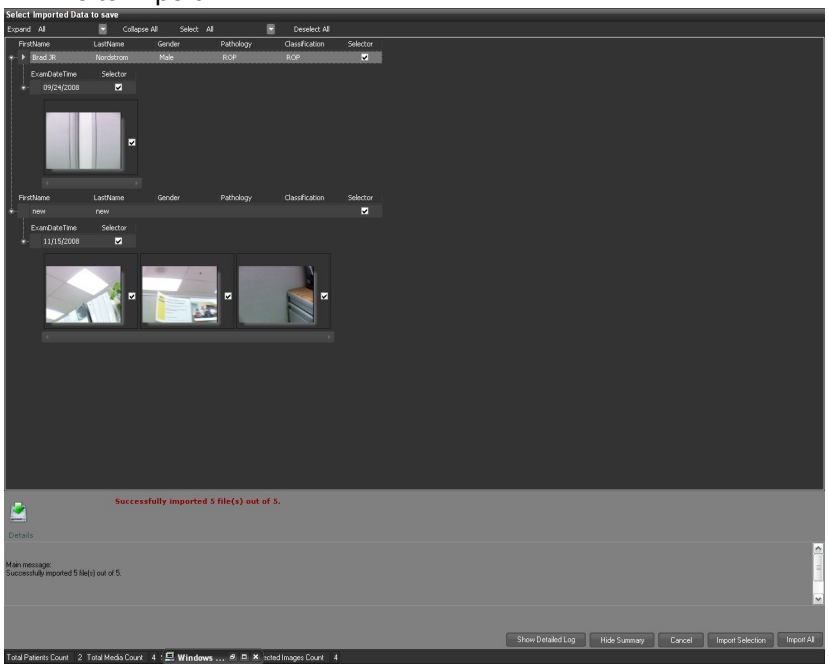


Figure 33 Select Import Data dialog

7. Select one of the options on the bottom menu.

Figure 34 Import options

Show Detailed Log	Provides details regarding the processed files selected for import.
Hide Summary	Hides Summary Information
Cancel	Cancel Importing
Import Selection	Allows importation of data only from checked items
Import All	Allows all processed files to be imported

The system will notify you when the import is completed.

Included subfolders check box

Select this check box if you want to import images in all subfolders of the source location. If not selected, you will import only the files found in the source location folder itself, and no images in its subfolders. To import files from a specific (patient) subfolder only, select that subfolder as the Source location.

Delete source files and subfolders after import check box

To manage the size of the export destination, select this check box to delete the source files and subfolders after import is complete.

Note: Do not select this check box if you or others want to import the same data to another RetCam station, which would be the case especially if you are importing from the backup repository.

Note: This does not affect any working RetCam database, but only the intermediate location where files are exported to and imported from.

8. Select Import to initiate importing, or Cancel . A dialog opens to show import progress.
9. A **Select Import Data to save** dialog will appear. If not all items were imported, you may select **Show Detailed Log** for the explanation. It could be because some files are duplicates (already in the destination database), or the file is not found, or it is corrupt, or the destination is write-protected.

   View imported data and select thumbnails you need to save. Select **Import Selection**. You can also select **Import All** to save all images.

   The system will notify you when the import is completed successfully.

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6 Printing Images

The **Print** button appears at the lower right of screens when printing is available.

Note: Print is only available if there is a printer attached to the system, either directly or through the network, if so connected.

WARNING: Never connect the RetCam Shuttle to a network or any externally powered devices or peripherals *during imaging*.

You can **Print Images** from the:

- **Exam Review Screen**
- **Compare Screen**
- **Patient list (or Patients and Exams screen):** Print images, reports, or both

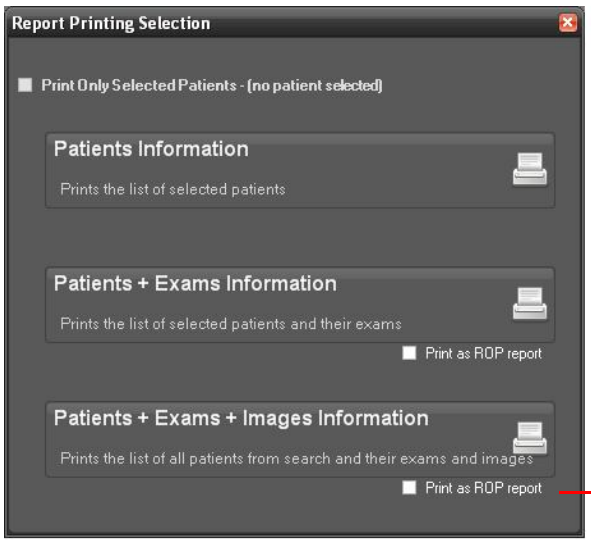
The default image size is 5" x 7." For optimal resolution, Clarity recommends printing images 5" x 7" or smaller. This also avoids the rapid depletion of printer ink.

Printing Images and Reports

You can print both images and reports from the patient list (or Patients and Exams screen):

1. Select (or highlight) patient.
2. Check the desired session, patient, or image.
3. Select **Print**.

The following dialog appears:


Report Printing Selection
Print Only Selected Patients - (no patient selected)
Patients Information
Prints the list of selected patients
Patients + Exams Information
Prints the list of selected patients and their exams
Print as ROP report
Patients + Exams + Images Information
Prints the list of all patients from search and their exams and images
Print as ROP report

If you select this option for more than 100 images at a time, a warning message appears

Figure 35 Print dialog

4. Select the desired option(s).

- **Reports are formatted to fit on US letter size or A4 paper.**
- **Note: Network printers used with the system must have a printer driver supported by Windows XP.**
- **Note: Be aware that you must change the paper in the printer when switching between printing images and reports.**

See the User Preferences section for information on setting printer defaults.

7 User Preferences

The section describes the User Preferences available, including:

- System Identification/Institution
- Setting Pre-configuration Imaging defaults for New Exams
- Changing Date/Time
- Changing Speaker Volume
- Setting Printer defaults
- Setting Network connections

Select the cog icon in the lower right hand corner to access the User Preferences.

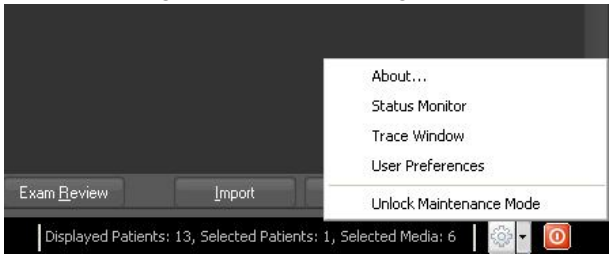


Figure 36 Access User Preferences

Select **About** to identify the RetCam software version. Select **OK** to exit.

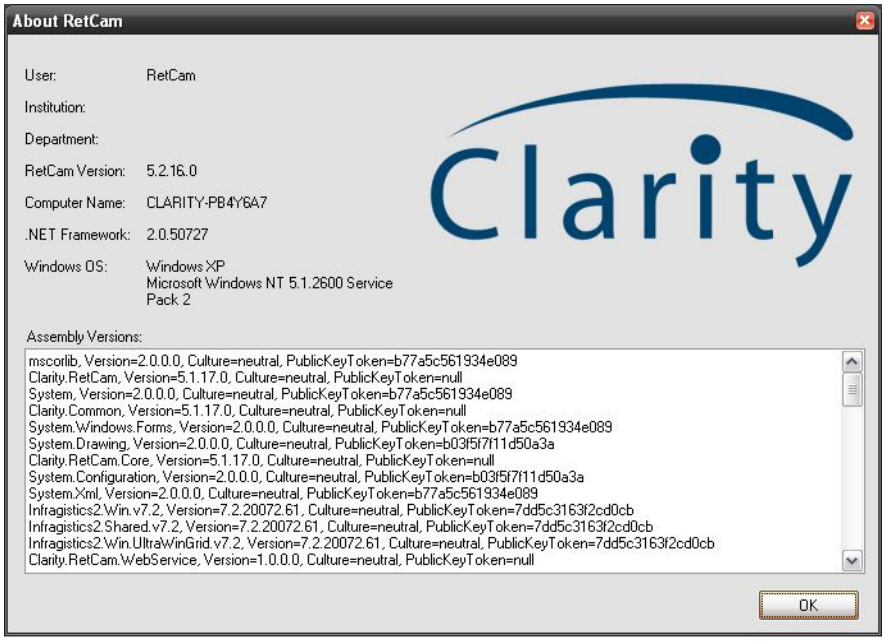


Figure 37 About Clarity software

Select **User Preferences**.

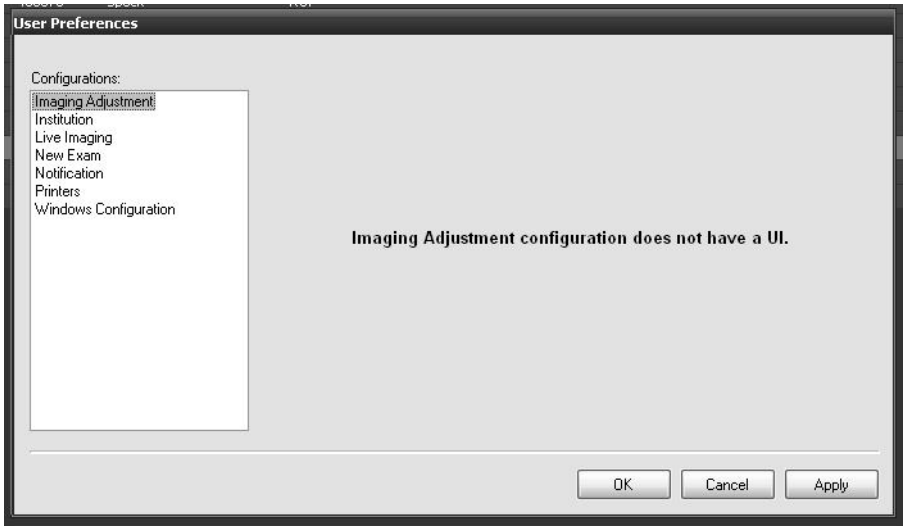


Figure 38 User Preferences screen

Select from the following options:

Imaging Adjustment	Not available
Institution	Add the name of the Institution, Department and Location.
Live Imaging	Not applicable
New Exam	Set the Pre-set Imaging Configurations for new exams.
Notification	Not applicable
Printers	Set the Default Image and Report Printer.
Windows Configuration	Set Date and Time, Display, Network Connections, Printers and Faxes, Region and Language, Security Center and Sound.

Institution

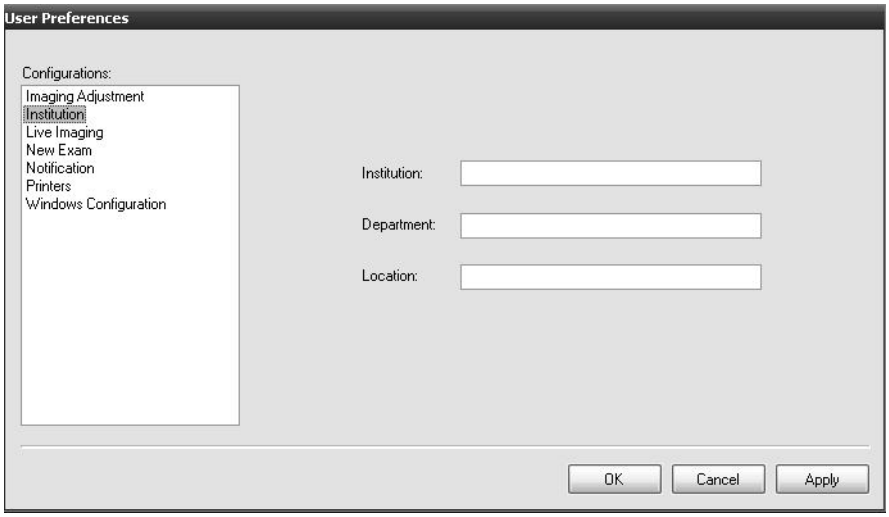


Figure 39 User Preferences: Institution

Note: To make an ampersand (&) symbol display properly, enter the symbol twice. For example, enter "Women && Children's Hospital" to display "Women & Children's Hospital."

New Exam

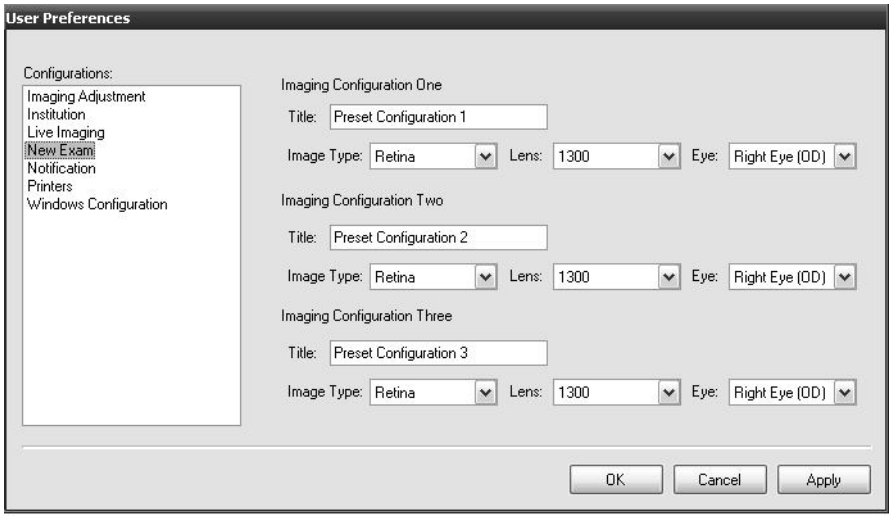


Figure 40 User Preferences: New Exam

Once the New Exam preset configurations are adjusted, select **Apply** to initiate the change or **Cancel**. Select **OK** to exit the screen.

Printers

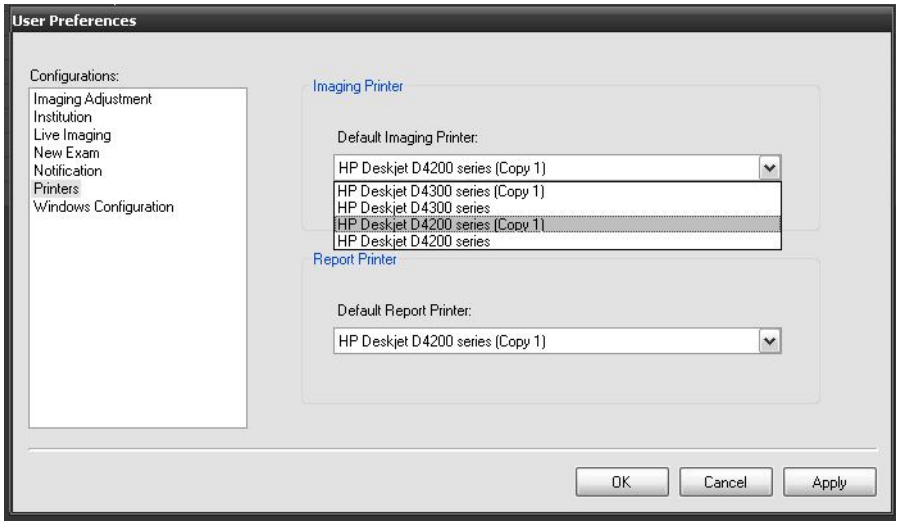


Figure 41 User Preferences: Printers

Select the default printers, then select **Apply** to initiate the change or **Cancel**. Select **OK** to exit the screen. You can add printers from the Windows Configuration.

Windows Configuration

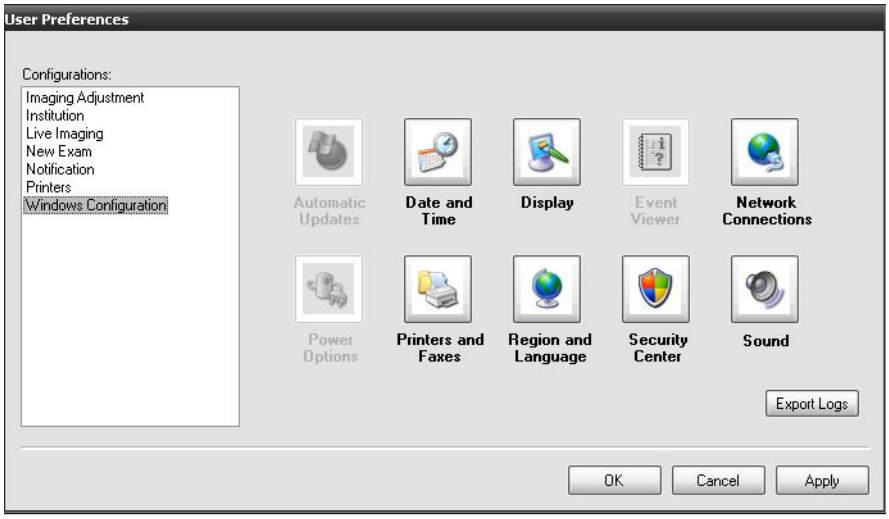


Figure 42 User Preferences: Windows Configuration

Select the desired Windows configuration icon and make changes where needed. Select **Apply** to initiate changes or **Cancel**. Select **OK** to exit the screen.

8 Maintenance and Support

This section addresses maintenance and support under the following topics:

- Recommended Maintenance Schedule, below
- Cleaning Procedures, below
- Fuse Replacement, page 60
- Replace Illumination Lamp/Bulb, page 61
- Key Validation, page 65
- Technical Support, page 66
- Clarity Technical Support Contact Information, page 66

Recommended Maintenance Schedule

Between patients: Clean and inspect lens piece.

Weekly: Wipe down the system.

Monthly: Inspect cables and connections for wear.

Burned out bulb: Replace illumination bulb

Blown fuse: Replace system fuses

Cleaning Procedures

Cleaning the Lens Piece

The patient contact area lens should be cleaned immediately after use to prevent the coupling gel from hardening.

1. Wipe away debris from the front lens piece surface with a soft dry tissue, sterile water soaked tissue, or combination.
2. Then, using a clean soft cloth (such as sterile gauze) saturated in a fresh solution of 70% IPA (Isopropyl alcohol), gently wipe the front of the lens piece, being sure to pay special attention to the concave contact lens area, to remove any remaining debris; at least eleven wipes with a clean saturated cloth. Pre-packaged swabs may be used.
3. Rinse surface thoroughly using sterile water.
4. Air dry.
5. Verify that the lens surface is free of debris and coupling gel. Repeat above steps if necessary.
6. Inspect the lens for damage and clarity. Do not use the lens if there are chips, cracks, or rough edges on the lens which may injure the patient’s eye.

CAUTION: Do not Autoclave any part of the system.

CAUTION: Never immerse the entire lens piece or handpiece in any liquid solution. If necessary, only the distal 4 mm can be immersed. See Figure 43.

WARNING: If you clean or disinfect, rinse the lens with sterile water to avoid corneal deepithelialization that may be caused by residual solution.

Note: For disinfection, the American Academy of Ophthalmology recommends 1:10 dilution of bleach soak for 5 minutes.

CAUTION: As disinfection solutions may cause corrosion of the lens piece, soak times that exceed the recommendation should be avoided.

Alternate Cleaning and Disinfection

Cleaning Solution (Double): FrankLab Enzymex L9 (immersion time between 5 to 15 minutes; no greater than 2 hours)

Disinfection: FrankLab Peraxy-Lens or Peralex H8+ (30 minutes minimum: no greater than 2 hours)

Please refer to the specific FrankLab Instruction on double cleaning and disinfection.

Note: Permissible immersion depth is illustrated in Figure 43 below. It is important not to immerse the joint where the polished metal tip meets the painted housing, since it is susceptible to corrosion.

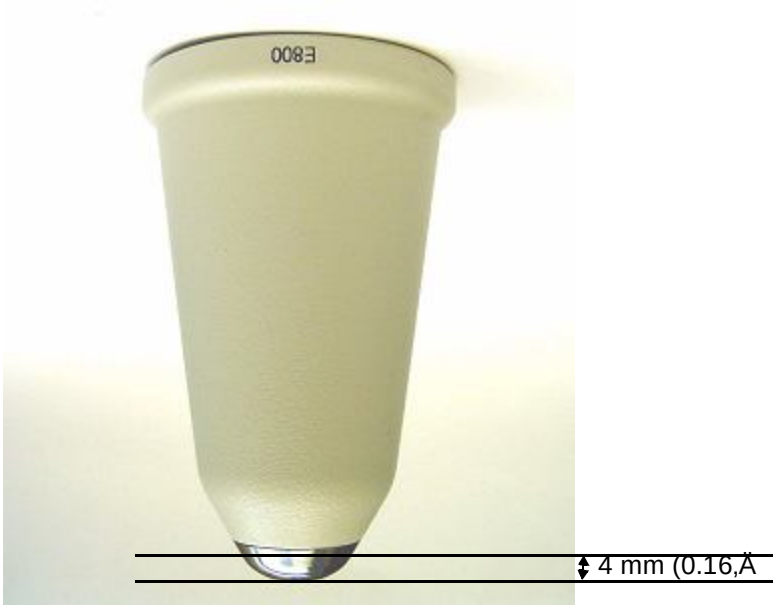


Figure 43 Inverted lens piece showing permissible depth of immersion

Cleaning the Rest of the System

As with any medical device, use good public health practices when handling the equipment, based on CDC guidelines. In addition, as with typical office equipment, a gentle wiping with a cloth moistened with mild soap and/or water is recommended. Do not spray cleaning solutions directly on the computer or other modules, spray the cloth instead. The cart and side panels also cannot be sprayed, but only the cloth with which you wipe, to avoid introducing spray or mist inside the system. Use only a mild soap and/or water solution.

The lens piece should be checked before each use for damage to the front contact lens and surrounding surface. The interconnect cable and connectors should be checked for damage to the end connectors and protective covers.

WARNING: Always inspect the lens before use for damage such as chips, cracks or roughness that could injure the patient's eye.

Disposal of Materials

Dispose of waste materials according to local and national requirements. Contact Clarity Service if additional assistance is required.

Fuse Replacement

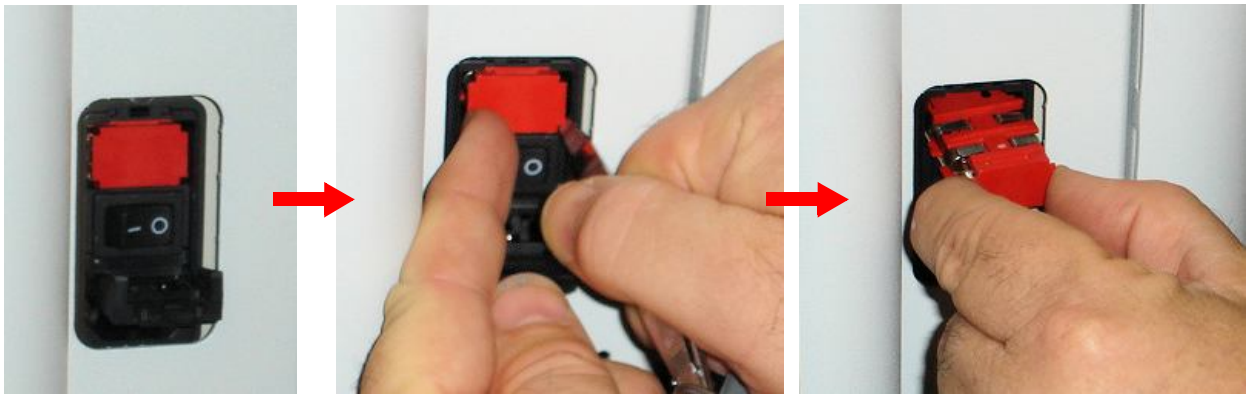
Locate the power entry module on the lower right side of the rear of the cart. Make sure to remove the power cord before proceeding any further. (See Figure 44.)

Figure 44 Power Entry Module

Using a flat blade screwdriver, gently pry open the cover of the fuse holder at the top of the power entry module. (See Figure 45.)

Figure 45 Opening the fuse holder cover

Remove the fuse holder. (See Figure 46.)



Cover open | Gently pry at edges to start removal | Finish removal with fingers

Figure 46 Removing the fuse holder

Remove the blown fuse from the fuse holder and replace it with a new fuse of same type and rating. (See Figure 47.) Reinsert the fuse holder.

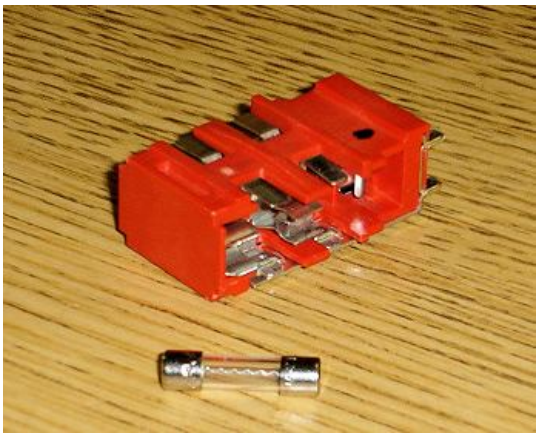


Figure 47 Blown fuse removed

CAUTION: For continued protection against risk of fire, replace only with same type and rating fuse.

Replacement fuses are available from Clarity Customer Service.

Replace Illumination Lamp/Bulb

WARNING: Appropriately shutdown and unplug the unit to allow the bulb to cool before replacing it.

Note: Replacement bulbs are available from Clarity Service.

1. If not already OFF, turn OFF the Main Power (see page 23).
2. Disconnect the power cord from the wall.
3. Unplug the fiber optic cable from the front panel.

4. Remove the two screws from the lamp assembly drawer.

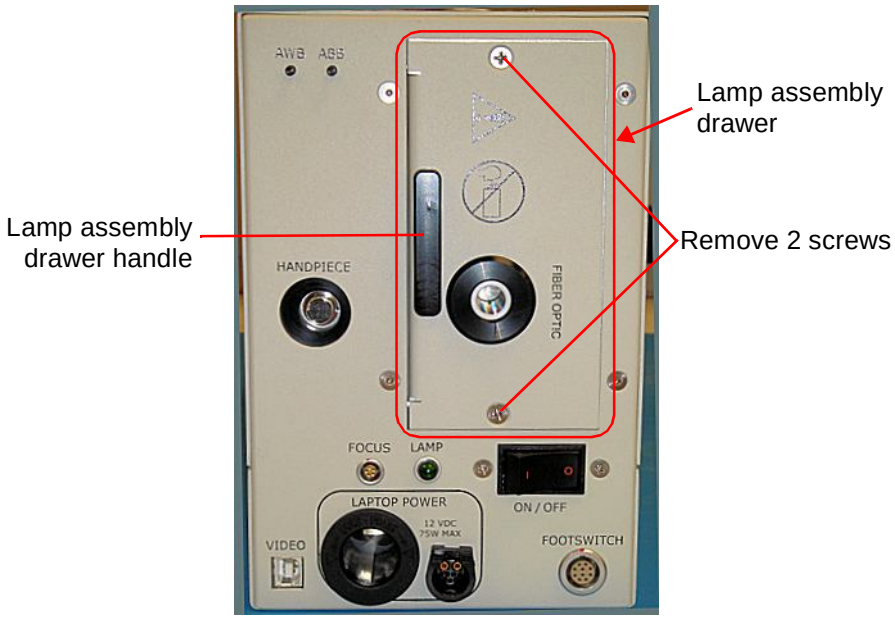


Figure 48 Front panel showing the lamp assembly drawer

5. Grip the handle on the lamp assembly drawer. Pull the drawer out slowly. Stop when the bulb is fully exposed.

Figure 49 Open lamp assembly drawer

6. Push the lamp ejector as shown.

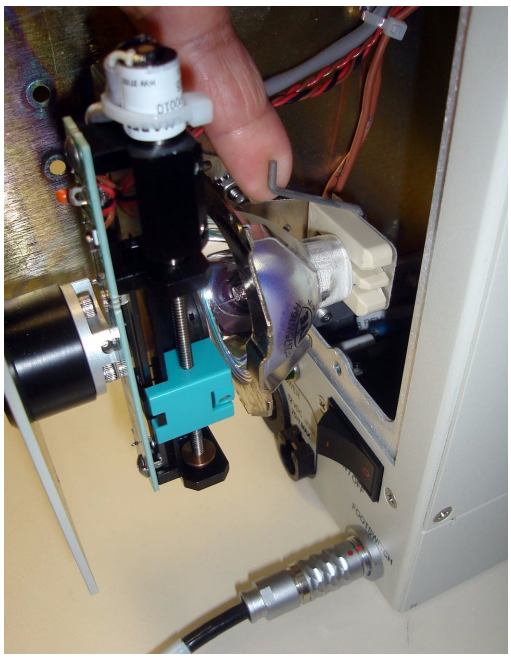


Figure 50 Eject the bulb

7. Carefully slide the bulb out of the socket slots.
8. Catch the bulb.

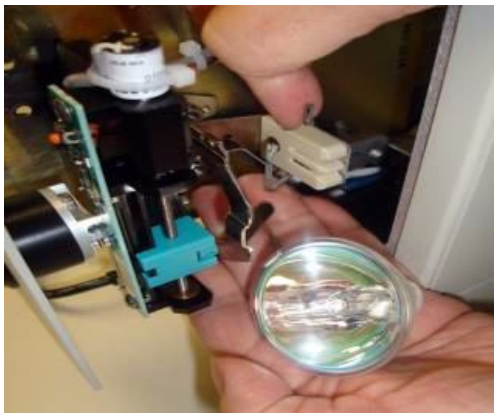


Figure 51 Catch the bulb

9. **Holding the new lamp only on the outside,** align the two pins of the bulb with the two slots in the socket. Push it all the way in.

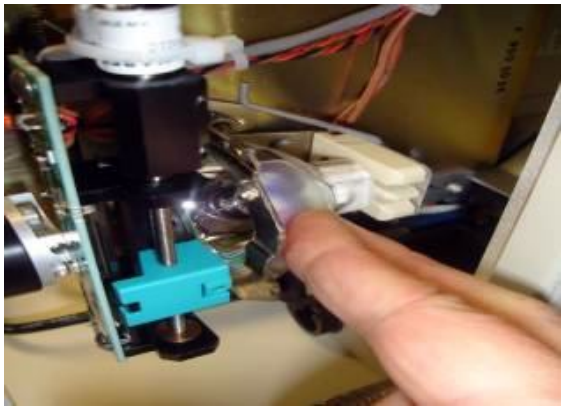


Figure 52 Insert new bulb

10. Carefully push the lamp assembly drawer back. Use caution to avoid pinching wires in the area.
11. Replace the two screws on the lamp assembly drawer and replace the fiber optic cable.

Figure 53 Replace lamp assembly drawer and fiber optic cable

Key Validation

Note: New RetCam Shuttle systems ship with their license key already registered and validated. However, significant changes to the system hardware or a re-load of the system software for any reason (including software upgrade) may require you to perform the key validation process as described below. Key validation requires that you get a license key from Clarity to use the revamped system, and you cannot request this key until after installation is complete. Since it may take up to two (2) business days to obtain a license key after submitting a request, we recommend that you affect system or software upgrades when you can manage two business days without use of the system.

Note: To ensure the preservation of your patient data and images, we strongly recommend that you perform a complete backup of the system's images before you begin any software installation.

When key validation is necessary, the Key Validation dialog appears when you start the system (and each time thereafter until you complete this step).

Key Validation
Call Clarity Medical Systems toll free at (800) 215-6005 (U.S. and Canada), or direct at (925) 463-7984 to get an authorization key for this installation. Read the license number below to customer support and enter the authorization key they give you in the field below. Then press 'Validate Key'.
71339298
Validate Key

Figure 54 Key Validation dialog

Follow the instructions on screen: Call Clarity and provide to the customer support representative the large license number in the dialog (71339298 in the example above), which is unique for your system. You will be provided in turn a unique authorization key.

> Tip: You may also send the license number via email to **service@retcam.com** and receive the authorization key by return email.

You must enter the authorization key in the field and select **Validate Key** to access the system software. If you call, to make sure you enter the number correctly, we recommend you do not hang up until the number is accepted.

Technical Support

Clarity Technical Support Contact Information

Customers outside the US, please contact your distributor for technical support.

In the US, you have the following options:

Telephone

Toll-free: (800) 215-6005

Fax: (925) 251-0078

Telephone support is typically available between the hours of 9am and 5pm Pacific Time.

Send correspondence to:

Clarity Medical Systems, Inc.

5775 West Las Positas Blvd.

Pleasanton, CA 94588

USA

E-mail

service@retcam.com

Our US technical support staff will respond to your questions as soon as a staff member is available. In most cases, you should receive an answer within 48 hours. Complex questions that require testing or special research may take longer.

Note: Questions about products no longer under warranty and questions other than to explain ordinary use of the product may incur service charges. Please ask for an hourly quotation before incurring charges.

9 Service

CAUTION: This section is intended for use by qualified technical personnel only. If in doubt, please contact the Clarity Service before proceeding.

Consumables and components can be ordered by calling or faxing the part description and part number to Customer Service.

Consumables

Part Description	Part Number
Illumination Bulb (halogen)	02-04-501
Fuses 3-amp 250 VAC 5x20mm (slo-blo)	20-000097
USB stick	03-12-025

Components

Part Description	Part Number
User Manual (Software v. 4.x)	20-000190
User Manual (Software v. 5.x)	20-000238
Notebook Computer - Hewlett Packard	20-000216
Footswitch	20-000009
Footswitch	18-000071
Handpiece (plastic shell)	21-100064
EO box	20-000008
Portrait Lens (PL100) for use with the metal shell handpiece	PL100
Portrait Lens (PL200) for use with the plastic shell handpiece	PL200
Standard Baby Lens	B1200
Premature Infant Lens	D1300
High Contrast Lens	E800
High Magnification lens	C300

Note: Information subject to change without notice. Contact Clarity Technical Service for the latest information.

Servicing the Cart

The notebook computer, EO box, Handpiece and Footswitch are modules that can be removed from the cart for replacement under the direction of the technical service department. Make note of the cable connections before removing a module.

Contact Clarity Technical Service for specific procedures and help troubleshooting problems to the module level before attempting repairs.

Notebook Computer Information

Note: The battery is not fully charged. Allow your battery to fully charge before using it (i.e., before disconnecting AC power). Calibrating the battery before use is also highly recommended. For information on the rechargeable battery of the notebook computer, please follow the laptop manufacturer's recommendations:

For the HPhttp://hp.com

Troubleshooting Guide

Problem	Troubleshooting Steps
No power to notebook computer	Check connections: Is the power cord plugged into the back of the system? • If not plug the power cord in. Is the main power switch in the back turned on? • If not then turn the main power on. Is the notebook power cable plugged into the notebook and the EO box? • If not, plug cable in.
No light from handpiece	Verify the fiber optic cable from the handpiece is inserted in the fiber optic port of the EO box. Verify the power switch in the back of the system and on the front of the EO box are turned on. Turn the power switch OFF for 10 minutes and then turn it ON. This will allow the lamp to cool. If after these measures are taken the lamp does not turn on, then replace the illumination bulb. (See Replace Illumination Lamp/Bulb on page 61.)

Problem	Troubleshooting Steps
No live image	Check connections: Is the USB cable from EO box to the notebook connected? Verify the cables are properly plugged in. Is the camera cable securely connected to the EO box? Verify the camera cable is inserted and threaded on.
Unable to SNAP image from footswitch	Is the USB cable from EO box to the notebook connected? Verify the cables are properly plugged in. Close the RetCam Shuttle program and reboot the notebook.
Images do not transfer	Verify the Export path and subfolder match the intended destination.
No network connection	Contact your Information Technology (IT) department.

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10 Technical Specifications

Hardware

Physical

- 19” (483 mm) wide x 19”(483 mm) deep x 34”(864 mm) high
- 65 lbs. (30 Kg)

Electrical

- Power consumption: 250 VA maximum
- Input Power: 100-240V~, 50/60 Hz
- Fuse: T 3A/250V

Software

- MS Windows® XP Embedded SP2 operating system

Environmental Conditions

The system as delivered is intended for use indoors, at normal room temperatures, upright, on a level surface, with the brakes applied to the front casters.

Condition	Operating	Storage and Transport
Temperature	59º to 95º F (15º to 35º C)	-4º to 122º F (-20º to 50º C)
Relative Humidity	10% to 95% non-condensing	10% to 85% non-condensing
Atmospheric Pressure	20.7 to 31.3 inches Hg (70 to 106 kPa)	14.7 to 31.3 inches Hg (50 to 106 kPa)
Altitude	-1255 to 9882 feet (-382 to 3012 meters)	-1255 to 18288 feet (-382 to 5574 meters)

Notebook Computer

- Intel® Core™ T2 Duo processor
- 2GB Random Access Memory
- 160 GB hard drive
- 4 USB connections
- Audio
- 10/100 Ethernet Adapter

Note: Specifications subject to change without notice.

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11 License Agreements

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